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in HPLC packings**

**Data acquisition
for the GPC user**

**Detecting N- and P-compounds
with gas chromatography**

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- C1 Chromatography:** 32,000 copies contain this section following p. 158.
- Int 1 International:** 7,000 copies contain this section following p. 158.
approx. 3,000 copies to nonqualified readers contain pp. 2A and 2B.
approx. 2,000 copies, randomly selected, contain pp. 2C through 2F.

ABOUT THE COVER

Microparticulate packings have provided column efficiencies of more than 60,000 theoretical plates per meter. Choice of appropriate column and mobile phase permits reversed-phase separations of most materials.

M.L. Van Kavelaar, DuPont electron microscopist, has prepared the 5,000X micrograph of "Zorbax" TMS particles — increased another 6.5X for this cover.

An article on column packing selection begins on p. 99 in this issue.

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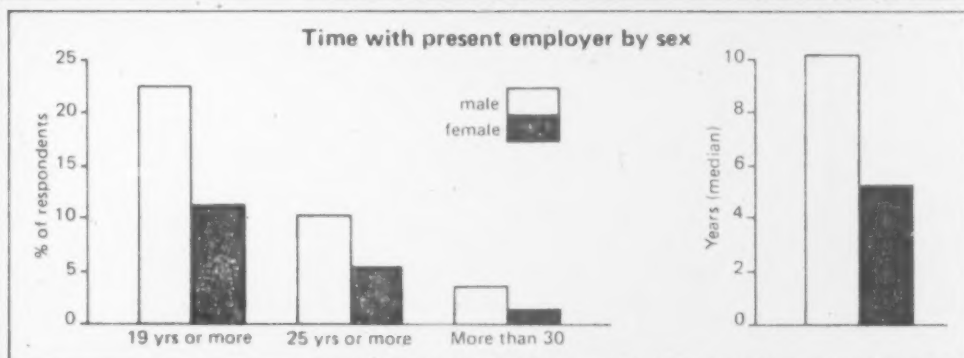
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EDITORIAL

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For pay alone, it's male, PhD, working for the government



Salary differences in R&D which can be explained only by sex are getting harder to find as women get a large portion of the bigger raises and add to their experience and academic achievements.

WOMEN IN R&D earn a lot less than men do. This is neither new nor surprising. And, where there have been areas of discrimination, there is some sign that efforts are being made to end it.

It's easy to oversimplify such a subject, but basically what women in R&D need to do in order to earn as large salaries as men in R&D is get more experience, get more education, and accumulate more years with their present employer.

Sex, however, is only one area where education, age, years of experience, and number of years with present employer don't seem to carry equal weight. The nature of the workplace also makes a notable salary difference. Government pays more than industry and both pay more than do universities.

When all of the differences apply, we find that the male R&D worker in government is earning a median annual salary of \$30,123 in contrast to the female R&D worker in a university where the median annual salary would be \$17,123.

This salary information is derived

from the responses of more than 5,000 of our readers to our annual salary survey. The first portion of this report appeared in the March issue, and dealt primarily with R&D-wide data and data broken out by professions.

In this concluding article, we will look, for the most part, at considerations of salary for R&D workers by sex and workplace. A year ago we presented this type of information for the first. This year we have approached the report with nearly twice as many respondents and with more correlations ordered out of our computer.

Getting back to those median salaries for R&D workers, we find that they are, when ranked from highest to lowest,

Men in government	\$30,123
Men in industry	28,804
Men in universities	26,070
Women in government	24,786
Women in industry	20,372
Women in universities	17,123

In our study, the median for all males in R&D is \$28,711 and for all females, \$20,756. These figures are close to the industry figures because industry provides the most jobs in R&D.

An interpretation of any significance in these median figures requires careful looks at a variety of parameters. As we mentioned at the beginning, women not only lag in salaries, they also lack many of

the factors which lead directly to larger salaries for persons of either sex.

Experience is such a factor. The median experience for the male respondents to this survey is 16.97 years; for the female respondents it is 8.14 years. Of the men, 38.3% had more than 20 years' experience. Only 16.1% of the women had as much. And 520 of the men responding, 10.9% of the total, had more than 30 years' experience.

You will remember from the chart in last month's issue that experience is a strong factor in size of salary. The latest salary-for-experience figures for 6 through 10 years (which includes the women's median) is right at \$25,000 for both sexes. The figure for the 16 through 20-year range (including the men's median experience) is close to \$31,000 for both sexes. It just happens that, for good and understandable reasons, there are more women in the brackets with the least experience.

In terms of education, we have seen over the years the benefits in the paycheck of advanced degrees. This year's premium (see March report) for a PhD over a BS for both sexes is \$5,943. This can easily amount to a career advantage for the PhD of at

least \$275,000. But most of the PhDs are held by men. Of our 5,000-plus respondents, 95.1% were male and 4.9% were female. Distribution of sexes by academic degrees is as follows:

	male	female
Less than bachelor's	96.1%	3.9%
Bachelor's	93.2	6.8
Master's	95.1	4.9
Doctorate	97.6	2.4

In most organizations longevity (time with that employer) is valuable. In some, it is everything. Again, for whatever reasons, men are in the positions to earn the benefits from longevity.

Our chart showing sex vs. time with present employer makes this obvious. Men, with a median of 10.1 years nearly double women's longevity at 5.28 years. And, because we have extended our scale for this year's survey, we can tell you for the first time that 3.4% of the men responding to this survey have worked for their present employer for more than 30 years. Half that proportion of the women are in that longevity of range, at 1.7%. However, even this longevity strength for women does not

Percentage of respondents by sex in each salary range

	No. responded	% male	% female
Total	5,034	95.1	4.9
Less than \$16,000 per year	241	80.0	20.0
\$16,000 to \$18,999	347	84.0	16.0
\$19,000 to \$21,999	497	91.7	8.3
\$22,000 to \$24,999	659	93.5	6.5
\$25,000 to \$27,999	719	96.6	3.4
\$28,000 to \$30,999	681	97.8	2.2
\$31,000 to \$33,999	567	98.4	1.6
\$34,000 to \$36,999	457	99.1	0.9
\$37,000 to \$39,999	328	99.1	0.9
\$40,000 to \$42,999	190	98.4	1.6
\$43,000 to \$45,999	142	100.	0.0
More than \$46,000 per year	206	98.5	1.5

Where R&D scientists and engineers work

Discipline	No. responded	% industry	% govt.	% univ.
Total responding	5,041	74.5	16.1	9.4
Chemists	1,875	79.7	14.0	6.3
Chemical engineers	404	85.6	10.4	4.0
Mechanical engineers	500	78.4	15.7	5.8
Electrical engineers	555	73.9	16.6	9.4
Aeronautical engineers	73	64.4	28.8	6.8
Industrial engineers	57	75.4	14.0	10.5
Physicists	458	58.5	25.8	15.5
Metallurgists	227	84.8	11.6	3.6
Biologists	226	46.5	19.5	34.1
Mathematicians	37	81.1	18.9	0.0
Other	629	68.4	17.8	13.8

change the fact that the bulk of women in R&D are at the low end of the longevity scale.

All of these factors that help to explain the differences in salaries for men and women in this field, do not completely justify the differences. That there has been sex discrimination is obvious, and we joined that issue at some length last year (Editorial and article, April *IR&D*).

Women did far better than men in the area of raises during the period covered by this survey. Although only 4.9% of the respondents are women, 7.5% of all raises of 14% or more went to women.

Looked at the other way, this means that one out of every seven women received a raise of 14% or more last year. Or, better than one out of every three women received a raise of 10% or more—well above the national guidelines. Considering all of the other factors reported here, a portion of these increases to women can be attributed to sex-vs.-salary adjustments.

Variations from a directly proportional distribution by sex in each salary range can be seen in the accompanying table.

The old idea that Uncle Sugar pays the best wages is hard to stomp out. That probably is because surveys such as this one tend to support that old idea.

In this study we learned that median salaries for R&D workers of both sexes were:

Government	\$29,733
Industry	28,354
University	25,685

And while you might point out (correctly) that there are proportionately more women working in the universities, we would counter with the fact that there is a substantially higher proportion of PhDs in the universities, and we have demonstrated earlier the salary advantages of the PhD degree.

An accompanying table shows you the tally of R&D scientists and engineers by discipline in industry, government, and university among our 5,000 respondents. Following are the responses to our Opinion Poll Questionnaire from all 5,000-plus respondents and for the 4.9% of all respondents who are female. Since male represents 95.1% of all responses, we are not showing male separately.

	All R&D	Female R&D
1. What is your annual salary (thousands)?		
a. Less than \$16	4.8%	18.2%
b. \$16 thru \$18	6.9	21.9
c. \$19 thru \$21	9.9	16.9
d. \$22 thru \$24	13.0	17.8
e. \$25 thru \$27	14.3	9.9
f. \$28 thru \$30	13.5	6.2
g. \$31 thru \$33	11.3	3.7
h. \$34 thru \$36	9.0	1.7
i. \$37 thru \$39	6.5	1.2
j. \$40 thru \$42	3.4	1.2
k. \$43 thru \$45	2.9	0.0
m. More than \$46	4.1	1.2

	All R&D	Female R&D
2. Your raise during the past year was...		
a. none	5.7%	6.3%
b. Less than 2%	1.5	1.3
c. 2 thru 5%	12.4	10.8
d. 6 thru 9%	52.0	44.8
e. 10 thru 13%	19.5	22.9
f. 14% or more	8.8	13.7
3. How many years have you worked for your present employer?		
a. Less than 1	5.9%	8.3%
b. 1 thru 3	18.2	32.2
c. 4 thru 6	16.3	22.3
d. 7 thru 9	10.9	10.3
e. 10 thru 12	10.4	7.0
f. 13 thru 15	9.2	4.1
g. 16 thru 18	7.9	5.0
h. 19 thru 21	5.9	4.1
i. 22 thru 24	5.2	1.7
j. 25 thru 27	4.2	1.7
k. 28 thru 30	2.5	1.7
m. More than 30	3.3	1.7
4. What is your age?		
a. Under 26	3.4%	14.0%
b. 26 thru 30	10.7	30.6
c. 31 thru 35	17.1	21.1
d. 36 thru 40	17.7	11.2
e. 41 thru 45	14.0	7.9
f. 46 thru 50	13.1	2.5
g. 51 thru 55	11.5	7.9
h. 56 thru 60	8.3	3.7
i. 61 thru 65	3.4	0.4
j. Over 65	0.8	0.8
5. How many years of experience do you have:		
a. Less than 1	1.3%	3.3%
b. 1 thru 5	12.9	36.8
c. 6 thru 10	17.2	23.1
d. 11 thru 15	17.3	12.4
e. 16 thru 20	14.0	8.3
f. 21 thru 25	13.2	5.8
g. 26 thru 30	13.4	5.8
h. 31 thru 35	6.0	3.7
i. 36 thru 40	3.4	0.8
j. More than 40	1.2	0.0
6. What is the highest degree you hold?		
a. Less than bachelor's	7.9%	6.2%
b. Bachelor's	38.2	53.7
c. Master's	25.7	26.0
d. Doctorate	28.2	14.0
7. What is your profession?		
a. Chemist	37.2%	57.4%
b. Chemical engr.	8.0	4.1
c. Mechanical engr.	9.9	0.8
d. Electrical engr.	11.0	2.9
e. Aeronautical engr.	1.5	0.4
f. Industrial engr.	1.1	1.7
g. Physicist	9.1	5.8
h. Metallurgist	4.5	2.9
i. Biologist	4.5	8.3
j. Mathematician	0.7	1.2
k. Other	12.5	14.0
8. Do you work in		
a. Industry	74.5%	78.1%
b. Government	16.1	13.6
c. University	9.3	7.0